

# Organization and Activities of the Doctoral Program in Earth Evolution Sciences (Geological Sciences) for the Academic Year 2014

journal or publication title	Earth Evolution Sciences
number	10
page range	15-18
year	2016-03-25
URL	<a href="http://hdl.handle.net/2241/00141636">http://hdl.handle.net/2241/00141636</a>

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## Organization

During the year from April, 2014 to March, 2015, several promotions and appointments were made in the Doctoral Program in Earth Evolution Sciences (Geological Sciences) so that our research and teaching activities were enforced. All faculty and administrative staffs are listed (staffs with an asterisk\* are belonging to the Doctoral Program in Integrative Environment and Biomass Sciences, but they are listed in our organization herewith, because they study geological sciences and have lectures on geological sciences for undergraduate students):

### *Professor:*

Arakawa, Yoji, D. Sc., petrology, geochemistry and geochronology  
Hayashi, Ken-ichiro, D. Sc., migration of heavy metals, geochemistry of hydrothermal system  
Hisada, Ken-ichiro, D. Sc., stratigraphy, sedimentology  
Sashida, Katsuo, D. Sc., Paleozoic and Mesozoic biostratigraphy  
Tsunogae, Toshiaki, Ph.D.(Sc.), metamorphic petrology and crustal evolution

### *Associate Professors:*

Agematsu, Sachiko, Ph.D.(Sc.), paleontology  
Enescu, Bogdan, Ph.D. (Sc.), seismology, structural geology  
Kamata, Yoshihito, Ph. D.(Sc.), stratigraphy, tectonics  
Ujiie, Kohtaro, Ph.D.(Sc.), structural geology, tectonics  
Yagi, Yuji, Ph.D. (Sc.), seismology, structural geology  
\*Maruoka, Teruyuki, Ph.D.(Sc.), geochemistry

### *Assistant Professor:*

\*Anma, Ryo, Ph.D., structural geology and tectonics  
Fujino, Shigehiro, Ph.D.(Sc.), sedimentology, stratigraphy, paleoseismology  
Ikehata, Kei, Ph.D. (Sc.), petrology, resource geology  
Komuro, Kosei, D. Sc., ore geology and geochemistry  
Kurosawa, Masanori, Ph.D. (Sc.), mineralogy and

geochemistry

Kyono, Atushi, Ph.D. (Sc.), structural physics of minerals

Takizawa, Shigeru, D. Sc., structural geology

### Cooperative Graduate School System

### *Professor:*

Takada, Akira, D. Sc., volcanology (Geological Survey of Japan: AIST, National Institute of Advanced Industrial Science and Technology)  
Naoki Kohno, D.Sc., mammalian paleontology (National Science Museum)

### *Research and Teaching Assistants:*

Miyamoto, Makoto  
Otani, Satoshi, B.A.  
Ozaki, Shiro  
Shimizu, Masahiro  
Watase, Koichi, B.A.

### *Administrative Staff:*

Isaka, Kyoko  
Yasuda, Yoko

## Doctor and Master's Theses

The following doctor and master's theses were completed during the academic year 2013 under the supervision of the members of the Doctoral Program in Earth Evolution Sciences.

### Doctor of Philosophy (Science or Geosciences)

Ohsumi, Tsuneo (2015): Investigation for mechanism of earthquake occurrence and relationship upheaval and subsidence based on structural geology.  
Saitoh, Yohsuke (2015): Petrology and partial melting of garnet-bearing mafic granulites from the Gondwana Orogeny.  
Shimono, Takaya (2015): Environmental rock-magnetism of Cenozoic red clay in the South Pacific Gyre.

#### Master of Science or Geoscience

- Furuichi, Hiroyuki (2015): Vitrinite reflectance and Raman spectra of carbonaceous material as indicators of frictional heating on faults: Constraints from friction experiments.
- Hashimoto, Takeshi (2015): Volcanic rocks in the vicinity of Salar de Atacama: origin of brine with high Li content.
- Iijima, Jun (2015): Quantative detection of attacking patterns in the Miocene-Pliocene Kiyosumi Formation of the Awa Group, Bobo Peninsula central Japan.
- Iwasaki, Akira (2015): The mineralization of Lace deposit in the Republic of Serbia insight from occurrence of ZnS minerals.
- Kumagai, Tomonori (2015): Ore texture and oxygen isotope of Shosen No. 5 gold-bearing quartz vein at the Hishikari deposit, Japan.
- Noguchi, Kazuhiro (2015): Frictional properties of calcareous oozes in the Costa Rica subduction zone.
- Onishi, Taku (2015): Diagenetic change of chemistry of marine manganese deposits: an experimental approach.
- Shimojo, Kengo (2015): Fluid-driven seismicity activation in northern Nagano region after the 2011 M9.0 Tohoku-oki earthquake.
- Takahashi, Yui (2015): Early Devonian conodonts from the Peris region, northwestern peninsular Malaysia.
- Tsuboyama, Takuto (2015): Temporal change in stress field near the focal region due to the 2011 Tohoku great earthquakes.

#### Master of Arts in Education

- Tanichi, Mayu (2015): The quartz/feldspar ratios of coastal and river sands and its sedimentological significance.

### Research Activities

Each researcher had the following research activities during the academic year 2014.

#### Research projects

- Agematsu, S. (2013~): Ordovician to Devonian conodont biostratigraphy and paleoenvironments in Thailand and Malaysia.
- Agematsu, S. (2014~): Reconstruction of the Triassic conodont apparatuses.
- Anma, R. (2012~): Paleoenvironmental changes in

West Asia.

- Arakawa, Y. and Shinmura, T. (2010~): Geological and petrological study of Aso volcano, Kyushu, Japan.
- Arakawa, Y., Matsui, T. and Ikehata, K. (2014~): Mineralogical and petrological studies of anorthite megacrysts in arc volcanic rocks.
- Arakawa, Y. (2010~): Petrological and geochemical investigations of volcanic rocks in Izu-volcanic arc and adjacent areas.
- Enescu, B. (2011~): Dynamic and static stress triggering of earthquake and tremor after the 2011 M9.0 Tohoku-oki earthquake.
- Enescu, B. (2009~): Modeling and forecasting of seismicity on the Japanese Islands.
- Fujino, S. (2007~): Stratigraphic records of past earthquakes and tsunamis along the Nankai Trough
- Fujino, S. (2014~): Potential risk of tsunamis generated at submarine active faults in western Japan.
- Hisada, K. and Poshtkoohi, M. (2012~): Tectonics of Middle East (Geology of Iran).
- Hisada, K. and Charusiri, P. (2012~): Tectonics of Indochina (Geology of Thailand).
- Ikehata, K. (2005~): Petrological and petrochemical studies of volcanic products from active volcano.
- Ikehata, K. (2006~): Development of analytical methods for non-traditional (e.g., Cu, Fe, Zn) stable isotope ratios of materials and its applications to geochemical samples.
- Kamata, Y. (2014): Stratigraphy and tectonics of the Paleo-Tethys in Thailand and Lao.
- Kamata, Y. (2014): Stratigraphy and tectonics of Jurassic accretionary complex in Japan.
- Komuro, K. (2013~): Geochemistry and formative environment of bedded manganese deposits in Japan.
- Komuro, K. (2015~): Tellurium and selenium mineralization in epithermal gold deposits.
- Maruoka, T. (2009~2014) Geochemical study for understanding the environmental perturbations at the mass-extinction events.
- Sashida, K. (2014~): Paleozoic and Mesozoic paleoenvironmental studies in Thailand and peninsular Malaysia.
- Tsunogae, T. and Santosh, M. (2014~2018): Crustal Evolution of the Gondwana suture zones in India and Sri Lanka.
- Tsunogae, T., Dunkley, D.J., and Miyamoto, T. (2014~2019): Pressure-temperature-time evolution of granulites in East Antarctica.

Tsunogae, T. and Dubessy, J. (2009~2015): Characterization of fluids in high- temperature granulites: evidence from quantitative Raman spectroscopic study.

Ujiie, K. (2007~): Field studies of the Shimanto accretionary complex and fault zones.

Ujiie, K. (2007~): Microstructural investigations of fault rocks in the Shimanto and Nankai accretionary complexes.

Ujiie, K. and many others (2007~): Fault zone drilling in the Nankai Trough, Costa Rica, and Japan Trench subduction zones.

Ujiie, K. and Tsutsumi, A. (2009~): Friction experiments on subduction zone materials.

Yagi, Y. (2012~): Seismic source process of large and great earthquakes derived from a hybrid back-projection and a new inversion.

Yagi, Y. (2012~): Mega quake risk management: A comprehensive approach towards mitigating earthquake-related disasters.

#### Research grants

Agematsu, S. (2013~2015): Paleoenvironmental changes across the Ordovician and Silurian boundary: Japan Society for the Science, Grant-in-Aid for Scientific Research (C), No.25400495.

Anma, R. (2012~2016): Paleoenvironmental changes recorded in sediments in West Asia. Grant-In-Aid for Scientific Research on Innovative Areas JPY 4,600,000 for 2014.

Arakawa, Y. (2013~2015): Precise determination of micro-inclusions within anorthite megacrysts in arc setting, and estimation of their parental magma. Grant-In-Aid for Scientific Research (C), JPY 1,100,000 for 2014.

Fujino, S. (2011~2015): Stratigraphic records of past earthquakes and tsunamis along the Nankai Trough. Program to Disseminate Tenure Tracking System, JPY 15,000,000 for 2014.

Hisada, K. (2012~): High-accuracy provenance study of clastics from Mesozoic accretionary complex on land, Grant-In-Aid for Scientific Research (C), JPY 5,200,000.

Hisada, K. (2012~): Ancient West Asian Civilization as the foundation of all modern civilizations: A counter to the Clash of Civilizations' theory. Grant-In-Aid for Scientific Research on Innovative Areas, 2012~2016, JPY 7,150,000.

Ikehata, K. (2014~2016): Study on formation mechanism of submarine native copper deposits based on copper isotopic measurement. Grant-in-Aid

for Young Scientists (B), JPY 3,250,000 for 2014.

Ikehata, K. (2014~2015): Geochemical research of formation mechanism of seafloor native copper deposits based on copper isotope analysis. 2014 Fujiwara Natural History Foundation, JPY 350,000 for 2014.

Kamata, Y. (2014): Internal structures of the Jurassic accretionary complex and its structural relationship with the Kurosegawa Belt. Grant-In-Aid for Scientific Research (C), JPY 186,000.

Kurosawa, M. (2012~2014): Studies on chemical compositions and behaviors of hydrothermal fluids in the M-type granitic bodies. Grant-in-Aid for Scientific Research (C).

Kurosawa, M. (2012~2016): The construction of databases for chemical compositions and textures of sherds and stone implements from archaeological sites in Western Asia. Grant-in-Aid for Scientific Research on Innovative areas.

Maruoka, T. (2014~2015): A multi-isotope approach to understanding paleo- environments in West Asia. Grant-in-Aid for Scientific Research on Innovative Areas (MEXT), JPY 3,200,000.

Tsunogae, T. (2014~2017): Petrology of Archaean continental fragments in Neoproterozoic Gondwana collisional orogeny. Japan Society for the Promotion of Science: Basic Research (B), JPY 6,900,000

Ujiie, K. (2014~2016): Establishment of frictional heating thermometer using Raman spectra of carbonaceous material. Japan Society for the Promotion of Science: Basic Research (B)

Yagi, Y. (2012~2015): Development of multi-data inversion that takes into account the uncertainty of model. Japan Society Promotion of Science: BasicResearch (C), JPY 5,200,000.

Yagi, Y. (2012~2015): Seismicity of East Asia. Japan Society Promotion of Science: JPY 10,790,000.

## Activity Reports for Academic Exchange and Cooperation

*Chulalongkorn University, the Kingdom of Thailand*

(1) Exchange of Researchers:

none

(2) Exchange of Graduate Students:

Alongkot Fanka (tokubetsukenkyusei; JESSO, from December 2014 to December 2015, Tsunogae, T.).

(3) Collaboration Research:

none

*Other universities or institutions*

(1) Exchange Researchers

Abd el-aziz Khairy Abd el-eal (Fellowship from the Egyptian Government, 6 months from January 2014, Yuji Yagi)

(2) Exchange of Graduate students:

None

(3) Collaboration Research:

Enescu, B. (2013~): Slow slip and aseismic deformation in subduction zones (with the group of Prof. D. Marsan, University of Savoie, France)

Enescu, B. (2013~, as a Visiting Associate Professor at the Institute of Statistical Mathematics (ISM), Tokyo): Statistical modeling of seismicity (with the Research Group of Professor J. Zhuang, ISM)

Enescu, B. (2012~): Mapping of the frequency-magnitude distribution of earthquakes along the Japanese subduction zones – implications for the occurrence of megathrust events. (with the Research Group of Prof. S. Wiemer, Swiss Federal Institute of Technology, Zurich).

Enescu, B. (2012~): Dynamic triggering of earthquake and non-volcanic tremor. (with the Research Group of Prof. K. Obara, Earthquake Research Institute, University of Tokyo).